Original article

Top 100 Most-Cited Papers in Substance Abuse: A Bibliometric Analysis and Evidence Mapping

Los 100 artículos más citados sobre abuso de sustancias: un análisis bibliométrico y mapeo de evidencia

Beatriz Martín-del-Río[1*] https://orcid.org/0000-0002-3917-4556
Adrián García-Selva[1] https://orcid.org/0000-0002-5545-7767
María-Teresa Cortés-Tomás[2] https://orcid.org/0000-0002-4492-2184
José-Antonio Giménez-Costa[2] https://orcid.org/0000-0003-0444-3119
Consolación Gómez-Íñiguez[3] https://orcid.org/0000-0002-8663-7189

[1]University Miguel Hernandez, Department of Behavioural Sciences and Health. Elche, Spain.
[2]University of Valencia, Faculty of Psychology, Basic Psychology Department. Valencia, Spain.
[3]University Jaume I, Faculty of Sciences of the Health, Department of Basic and Clinical Psychology and Psychobiology. Castellón de la Plana, Spain.

[*]Corresponding autor: bmartin@umh.es

ABSTRACT

The citations of an article reflect its impact, recognition and influence in the scientific and professional community, as well as providing a way of understanding the socio-organisational structure, in this case of the area of substance abuse research. The objective is to analyse the 100 most cited articles in the Web of Science, which have been published in journals in the Substance Abuse category of the Journal Citation Reports. The methods applied are retrospective bibliometric analysis and scientific mapping. Forty journals were identified in the category "Substance Abuse". A WOS search was conducted and the 100 most cited articles were selected. Title, authors, institutions, countries, year and citations were

extracted from WoS. JCR impact factor, citation density, immediacy index, quartile and country were calculated. Citation density and Bradford's law were calculated, and studies were classified according to their design and topic. All studies analysed are citation classics published over 40 years, and the most recent ones were the most cited. The most frequent design was review, while longitudinal and randomised control studies were rare. In terms of subject matter, substance assessment and diagnosis dominated, with little representation of behavioural addictions. Authors from all five continents participated, and the majority were from the United States. Most of the studies were published in four journals with a higher average impact factor than others in related areas. There is a clear tendency to cite reviews, evaluations and diagnostic studies related to substance abuse.

Keywords: substance abuse; bibliometrics; data science; impact factor.

RESUMEN

Las citas de un artículo reflejan su impacto, reconocimiento e influencia en la comunidad científica y profesional, además de proporcionar una forma de entender la estructura socio-organizacional, en este caso del área de investigación, sobre el abuso de sustancias. El objetivo fue analizar los 100 artículos más citados en la *Web of Science*, que han sido publicados en revistas, de la categoría “abuso de sustancias” del *Journal Citation Reports*. Los métodos aplicados fueron el análisis bibliométrico retrospectivo y el mapeo científico. Se identificaron 40 revistas en la categoría "abuso de sustancias". Se realizó una búsqueda en WOS y se seleccionaron los 100 artículos más citados. Se extrajeron de WoS el título, autores, instituciones, países, año y citas. Se calcularon el factor de impacto del JCR, la densidad de citas, el índice de inmediatez, el cuartil y el país, la ley de Bradford y se clasificaron los estudios según su diseño y tema. Todos los estudios analizados son clásicos de citas publicados en más de 40 años y los más recientes son los más citados. El diseño más frecuente fue el artículo de revisión, mientras que los estudios longitudinales y de control aleatorio fueron escasos. En cuanto al tema, dominaron la evaluación y el diagnóstico de sustancias con poca representación de las adicciones comportamentales. Participaron autores de los cinco continentes, la mayoría era de Estados Unidos y los estudios se publicaron,

fundamentalmente, en cuatro revistas con un factor de impacto promedio más alto que otras en áreas relacionadas. Hay una clara tendencia a citar revisiones, evaluaciones y estudios diagnósticos relacionados con el abuso de sustancias.

Palabras clave: abuso de sustancias; bibliometría; ciencia de datos; factor de impacto.

Received: 31/07/2023

Accepted: 24/01/2024

Introduction

Approximately 269 million people worldwide used drugs in 2018 (30% more than in 2009). This corresponds to 5.4% of the global population aged 15-64 years. Furthermore, over 35 million people are estimated to suffer from drug use disorders, meaning that their pattern of drug use is harmful or that they may experience drug dependence and/or require treatment (0.7% among the population aged 15-64 years).[1] Extensive contributions to the scientific literature around Substance Abuse (SA) are made every year and review studies ensure professionals to be updated.

It is of interest to identify the research areas with the most visibility and influence and the documents that have laid the conceptual and methodological foundations of this field. With an analysis of the most frequently cited studies in a scientific field, it is possible to identify the most recognized and influential international contributions, the most prominent authors, the trending topics, and even the least prominent focuses.[2] The greater the citation history of an article is, the more valuable this study is assumed to be in its area of knowledge.[3]

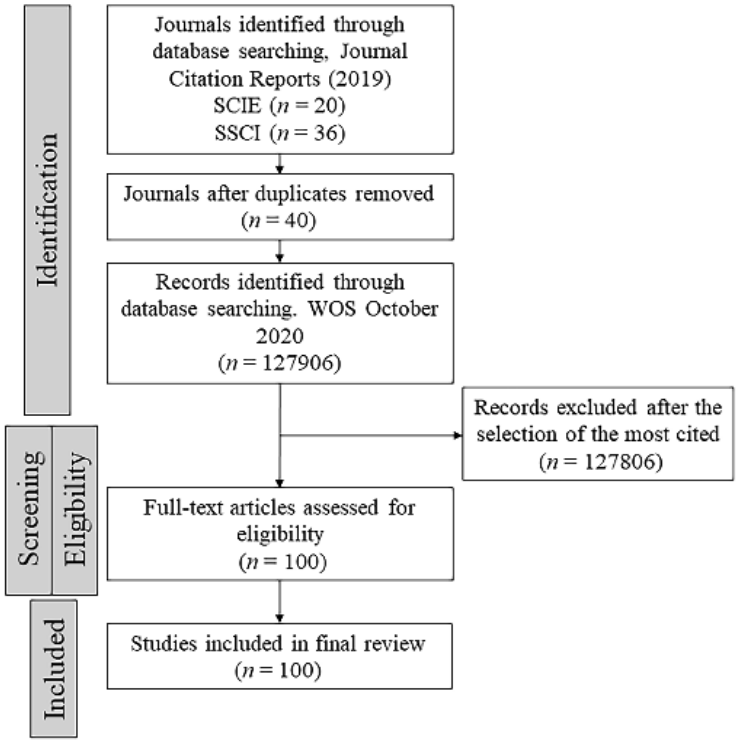
The objective of this study is to analyse, from a bibliometric perspective, the characteristics of the 100 most cited studies (T100) indexed in the Web of Science (WOS) database and published in journals that are included in the Substance Abuse category of the Journal Citation Reports (JCR), 2019 edition, to 1/ examine patterns of publications and citations; 2/ identify the most cited journals and authors; 3/

explore the contribution of various countries to publications; and 4/ identify the network words used in the titles of these studies as well as the study designs and themes.

Methods

Data source, data search methods and inclusion criteria

In October 2020, the journals under the 2019 JCR Substance Abuse category, the Science Citation Index (SCIE) (n = 20) and the Social Science Citation Index (SSCI) (n = 36) were identified. A total of 40 journals were selected by excluding duplicates. Subsequently, a search was carried out in the WOS combining the names of the 40 journals using the Boolean operator 'OR' in the area 'publication name' with no restriction of time, type of study, language or availability. A total of 127906 studies were obtained. After sorting them with the 'times cited' option, the only inclusion criterion was being one of the 100 most cited studies in the SA category.



Source: Own elaboration

Fig. 1 – Flow of information through the different phases of the review.

From the JCR, the data regarding the journals, their citation density and impact factor, data for calculating the immediacy index, quartile by category and country were obtained. From the WOS, the title, authors, author affiliations (institution, organization and country), year of publication and number of citations received were obtained.

Three investigators reviewed the same articles independently, and the study designs were classified as follows: (a) review studies, systematic reviews and meta-analyses, (b) development and validation of instruments or scales, (c) cross-sectional studies, (d) studies with qualitative methodology, (e) discussions of topics or methods, and (f) other types of studies that were not included in another category, e.g., longitudinal studies.[4] In addition, they classified each article according to its topic, as follows: (a) Prevalence and epidemiology; (b) Evaluation and diagnosis; (c) Intervention; (d) Determinants; (e) Consequences; (f) Prevention; (g) Theoretical/explanatory model; and (h) Comorbidity. No reliability test among observers was performed, but disagreements were rare and were resolved in a meeting by reaching a consensus.

As a relative impact index, the citation density, or mean number of annual citations, was calculated for each study and for each journal.[5,6] In addition, Bradford's Law[7,8] was calculated to classify the journals into three groups of decreasing productivity. Each group contains a similar number of articles published by a decreasing number of journals, making it possible to determine a first group of major producing journals and two others of lower productivity in geometric progression.

Statistical analysis

Microsoft Excel 2018 was used for descriptive statistical analyses and to create bubble plots. Data analysis was completed using SPSS Statistics 26.0.[9]

Finally, VOSviewer 1.6.15[10] was used to extract information, create network maps for countries and identify keywords from the titles and not from the keywords provided by the authors, because 44% of the articles did not include them. Before the analyses, data were standardized manually by the authors (e.g., different terms for the same country). For the interpretation of a network, each node represents a specific element (country or word), and the size of the node indicates the frequency

of occurrence (the higher the frequency, the larger the size). Links between the nodes show they are connected, and the thicker the lines are, the closer the relationship between the nodes is. Nodes with different colours represent different clusters or mean citations.

Table 1 - The 100 most cited studies in the category of substance abuse*

Rank	Cites	CD	CD Rank	Article		Rank	Cites	CD	CD Rank	Article
1	6842	253.41	1	(A1)		51	542	25.81	75	(A2)
2	3037	108.46	3	(A3)		52	541	41.62	34	(A4)
3	1665	43.82	30	(A5)		53	539	15.85	99	(A6)
4	1648	39.24	41	(A7)		54	535	16.72	97	(A8)
5	1506	75.30	5	(A9)		55	535	19.11	93	(A10)
6	1460	63.48	10	(A11)		56	534	35.60	55	(A12)
7	1121	29.50	63	(A13)		57	534	48.55	26	(A14)
8	1048	38.81	44	(A15)		58	533	24.23	79	(A16)
9	1037	64.81	9	(A17)		59	526	15.03	100	(A18)
10	996	55.33	18	(A19)		60	522	40.15	38	(A20)
11	995	47.38	27	(A21)		61	522	58.00	14	(A22)
12	971	57.12	16	(A23)		62	513	19.73	91	(A24)
13	942	47.10	28	(A25)		63	506	20.24	88	(A26)
14	939	49.42	25	(A27)		64	505	36.07	51	(A28)
15	893	68.69	7	(A29)		65	501	35.79	52	(A30)
16	873	51.35	21	(A31)		66	500	26.32	73	(A32)
17	827	51.69	20	(A33)		67	498	29.29	65	(A34)
18	827	137.83	2	(A35)		68	495	22.50	83	(A36)
19	819	37.23	48	(A37)		69	489	32.60	58	(A38)
20	817	74.27	6	(A39)		70	485	30.31	62	(A40)
21	806	62.00	11	(A41)		71	479	26.61	70	(A42)
22	805	67.08	8	(A43)		72	477	36.69	49	(A44)
23	801	32.04	59	(A45)		73	472	31.47	60	(A46)
24	780	25.16	77	(A47)		74	471	52.33	19	(A48)
25	762	40.11	39	(A49)		75	470	18.80	94	(A50)
26	743	57.15	15	(A51)		76	469	39.08	42	(A52)
27	726	40.33	35	(A53)		77	467	17.30	96	(A54)
28	726	40.33	36	(A55)		78	467	21.23	84	(A56)

29	712	41.88	33	(A57)		79	466	25.89	74	(A58)
30	688	36.21	50	(A59)		80	466	38.83	43	(A60)
31	688	43.00	32	(A61)		81	465	33.21	57	(A62)
32	679	16.56	98	(A63)		82	465	35.77	53	(A64)
33	675	17.76	95	(A65)		83	464	35.69	54	(A66)
34	660	60.00	13	(A67)		84	461	51.22	22	(A68)
35	649	43.27	31	(A69)		85	458	76.33	4	(A70)
36	634	37.29	47	(A71)		86	457	22.85	82	(A72)
37	626	34.78	56	(A73)		87	456	38.00	45	(A74)
38	623	28.32	67	(A75)		88	454	19.74	90	(A76)
39	618	30.90	61	(A77)		89	454	20.64	85	(A78)
40	616	24.64	78	(A79)		90	452	20.55	86	(A80)
41	615	55.91	17	(A81)		91	452	37.67	46	(A82)
42	613	61.30	12	(A83)		92	449	20.41	87	(A84)
43	584	25.39	76	(A85)		93	449	26.41	71	(A86)
44	576	19.20	92	(A87)		94	449	26.41	72	(A88)
45	564	23.50	80	(A89)		95	449	44.90	29	(A90)
46	563	26.81	69	(A91)		96	442	27.63	68	(A92)
47	563	40.21	37	(A93)		97	441	20.05	89	(A94)
48	559	29.42	64	(A95)		98	439	29.27	66	(A96)
49	559	50.82	23	(A97)		99	438	23.05	81	(A98)
50	551	50.09	24	(A99)		100	438	39.82	40	(A100)

Legend: CD: Citation density. Mean number of annual citations.

Footnote: *The bibliographical references of the 100 papers can be found in Annex I.

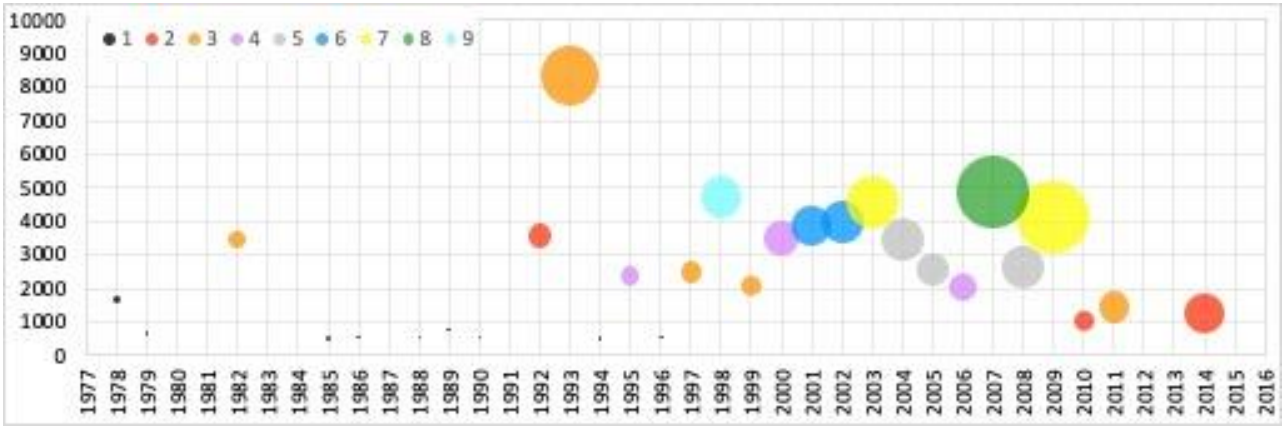
Source: Own elaboration.

Results

Top-cited articles, publication year and citations

The T100 articles (table 1) received 73118 citations, ranging from 438 to 6842. They were published between 1978 and 2014 (fig. 2). The highest number of cited articles were published in the decade from 2000-2009 (n = 57), and almost half of the citations of articles occurred then (n = 35843, 49.02%). A significant correlation was obtained between the total number of citations and the year of publication (rho

=.373; *p* =.046) and between the mean number of annual citations and the year of publication (rho =.713; *p* =.000).



Legend: X-axis: publication year; Y-axis: total number of citations; bubble size: mean number of citations; colors: number of articles.

Source: Own elaboration.

Fig. 2 – Temporary distribution of studies and citations.

Table 2 - Characteristics of the 100 most cited articles in substance abuse

	n.º	Citations
Year of Publication		
1970-1979	2	2327
1980-1989	7	5841
1990-1999	27	25306
2000-2009	57	35843
2010-2014	7	3801
Authors		
Barbor TF	8	11548
Miller WR	6	4477
Allen JP, Chou SP, Dawson DA, Grant BF, Koob GF, Pickering RP, Tonigan JS	4	20165
Anton RF, Del Boca FK, Diclemente CC, Hughes JR, Monteiro M, Stinson FS, Finney JW	3	16601
Authors' Country		
USA	190	128977
Canada	18	12122
Australia	13	21260
England	11	6751

Switzerland	8	17429
Brazil; Sweden	4	5885
Italy, Mexico, New Zealand, Poland, Scotland	3	14971
Germany, India; Israel, Netherlands, South Africa, Wales, Zimbabwe	2	8735
Authors' Institution		
Univ. of Washington	13	7488
Univ. of Vermont	11	6231
Univ. Connecticut	10	11599
Harvard Univ., National Institute on Alcohol Abuse and Alcoholism (NIAAA)	8	11027
Univ. New México; Univ. Toronto	6	8051
Yale Univ.; World Health Organization (WHO)	5	18131
National Institute on Drug Abuse (NIDA), Univ. New South Wales; Univ. of South Florida	4	9714
Scripps Research Institution, Univ. Auckland, Univ. California Los Ángeles, Univ. Colorado, Univ. Michigan, Univ. Oxford, Univ. Sydney, Washington Univ.	3	26989
Journals		
Addiction	32	25964
Alcoholism – Clinical and Experimental Research	15	9245
Drug and Alcohol Dependence	13	8288
Addictive Behaviours	8	7594
Nicotine & Tobacco Research	6	3871
Tobacco Control	5	2869
Journal of Substance Abuse Treatment, Journal of Studies on Alcohol – Journal of Studies on Alcohol and Drugs	4	7713
Addiction Biology, Alcohol Research & Health, British Journal of Addiction, Journal of Drug Issues	2	2647
Alcohol and Alcoholism, American Journal of Drug and Alcohol Abuse, American Journal on Addictions, Psychology of Addictive Behaviors, Substance Abuse	1	2647
Study Design		
Review	43	26862
Instrument validation	23	25272
Cross-sectional study	16	10054
Discussion	15	9487
Other-Longitudinal	3	1443
Study Topic		

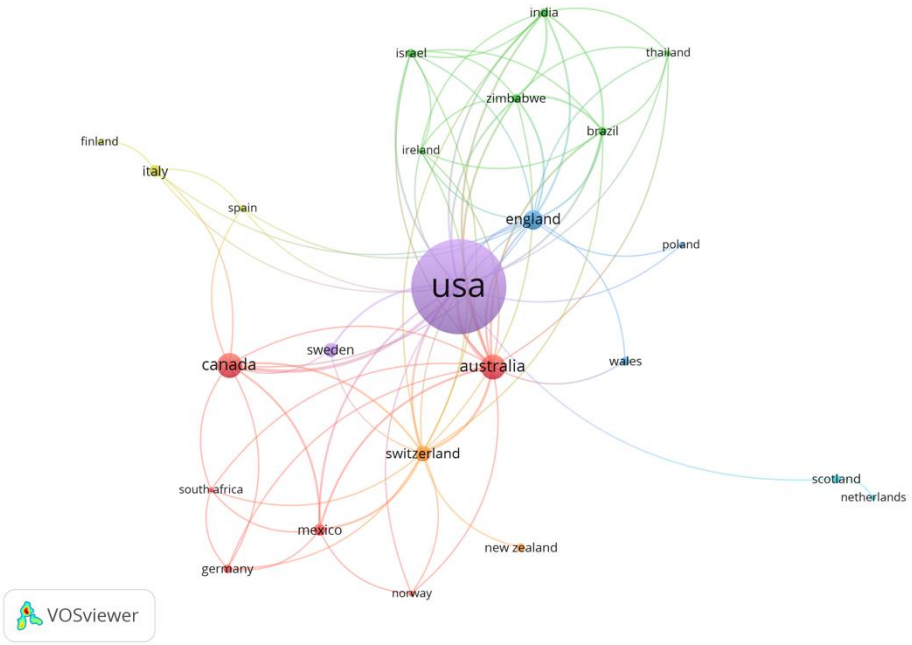
Evaluation / Diagnostic	31	31171
Determinants	24	14673
Intervention	17	11205
Consequences	11	6233
Theoretical Explanatory Model	6	3863
Prevalence / Epidemiology	5	3011
Prevention	4	1996
Comorbidity	2	966

Source: Own elaboration.

Authors, countries and institutions

A total of 396 different authors contributed to the T100, with a range of between one and 36 authors per study (M = 4.78; ME = 3). A total of 87.12% contributed to a single study, while the rest (12.88%) contributed between two and eight studies (table 2).

They belonged to 170 institutions from 24 countries representing all continents (table 2). Most of the studies involved authors from the Americas (76.24%), with the USA standing out. In the background are the authors from Europe (14.89% of the entries), from Oceania (5.67%), from Asia (1.77%) and Africa (1.42%). The collaboration network among countries (fig. 3) showed seven groups of international collaboration. The largest international network was led by the USA (17 countries, 36 studies). Australia and Switzerland collaborated with 15 countries each on 21 and 26 studies, respectively.



Source: Own elaboration.

Fig. 3 – Cooperation among countries that contributed to the T100.

Distribution of journals

The T100 were published in 18 of the 40 journals (45%) in the 2019 JCR Substance Abuse category (table 3). The impact factor ranged from 6.726 to 1.214. In addition, the majority were located in the second (40%) and first (33.33%) quartiles.

Table 3 - The journals in which the 100 most cited articles were published

Journal	n.[0]	Citations	JCD[1]	IF[2]	JIF[3]	Quartile in category	Country
Addiction / British Journal of Addiction[4]	32 / 2	27279	46.84	6.343	2.297	Q1	England
Alcoholism-Clinical and Experimental Research	15	9245	58.54	3.235	0.638	Q2	USA
Drug and Alcohol Dependence	13	8288	46.97	3.951	0.709	Q1	Switzerland
Addictive Behaviours	8	7594	45.25	3.645	0.930	Q2	England
Nicotine & Tobacco Research	6	3871	42.88	3.727	2.385	Q1	England
Tobacco Control	5	2869	40.95	6.726	3.923	Q1	England
Journal of Substance Abuse Treatment	4	4460	46.70	3.083	0.486	Q2	USA

Journal of Studies on Alcohol and Drugs / Journal of Studies on Alcohol[5]	2 /2	3253	44.81	2.350	1.603	Q3	USA
Addiction Biology	2	1710	55.33	4.121	2.434	Q1	England
Alcohol Research & Health[6]	2	887	--	-	-	-	USA
Journal of Drug Issues	2	1015	57.13	1.214	0.152	Q4	USA
Alcohol and Alcoholism	1	551	41.29	2.078	0.674	Q3	England
American Journal of Drug and Alcohol Abuse	1	449	63.14	2.925	1.391	Q2	USA
American Journal on Addictions	1	542	37.47	2.371	0.600	Q2	USA
Psychology of Addictive Behaviours	1	564	55.26	2.780	0.338	Q2	USA
Substance Abuse	1	541	36.34	2.652	1.015	Q3	USA

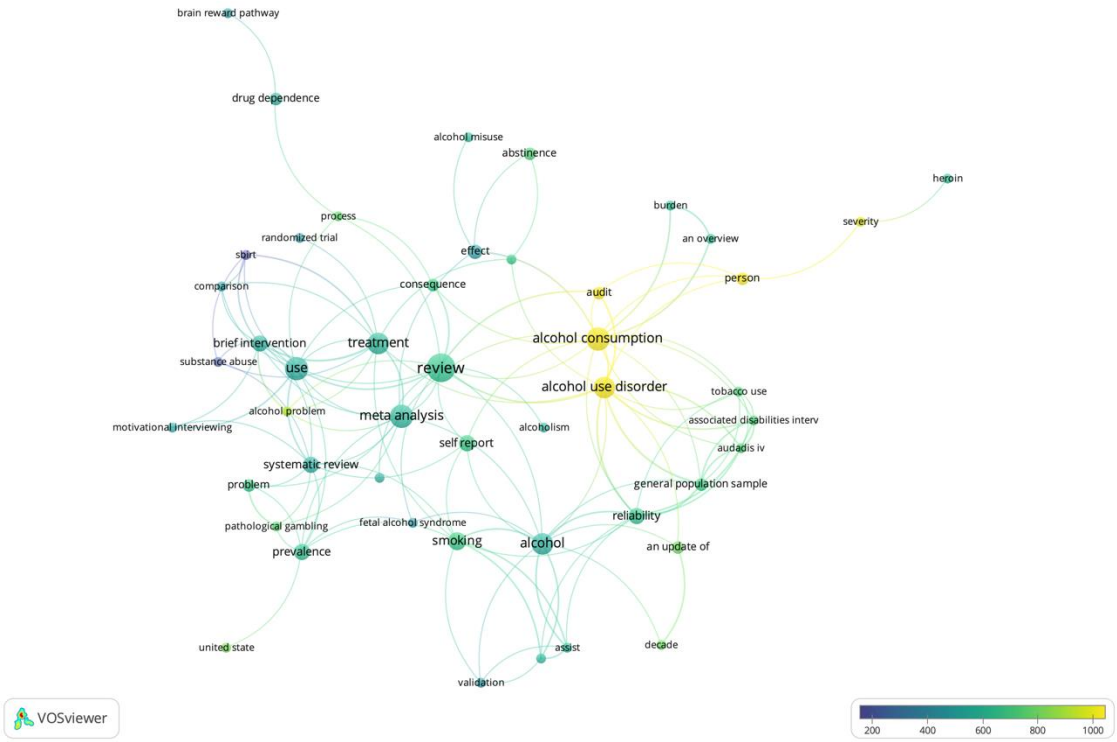
Legend: [1]JCD Journal Citation density 2019: number of references/number articles combined; [2]IF: Impact Factor 2019 according to the JCR. [3]JIF: Journal Immediacy Index; [4] *The British Journal of Addiction* ceased publication in 1993 and was renamed *Addiction*. The data in the table reflect those of the active journal. [5] *The Journal of Studies on Alcohol* ceased publication in 2006 and was renamed the *Journal of Studies on Alcohol and Drugs*. The results of the table reflect those of the active journal.[6]The *Alcohol Research & Health Journal* ceased publication in 2011.

Source: Own elaboration.

According Bradford's Law,[7,8] the core area of the distribution included a single journal (formerly *British Journal of Addiction* and currently *Addiction*) with 34 documents and 37.31% of citations. The second area of productivity comprised three journals: *Alcoholism-Clinical and Experimental Research*, *Drug and Alcohol Dependence* and *Addictive Behavior* (36 articles; 34.36% citations). The remaining 13 journals were included in area three (30 articles; 28.33% citations).

Study design and study topic

In the mapping of key concepts in SA, 48 terms appeared two or more times in the T100 titles (fig. 4). The most frequent were 'review', 'alcohol consumption', 'meta-analysis', 'use', 'alcohol', 'alcohol use disorder' and 'treatment'. And the most cited concepts were 'person', 'audit', 'alcohol consumption', 'alcohol use disorder', 'severity' and 'alcohol problem'. These concepts can be considered the hotspots of research in the field of SA.

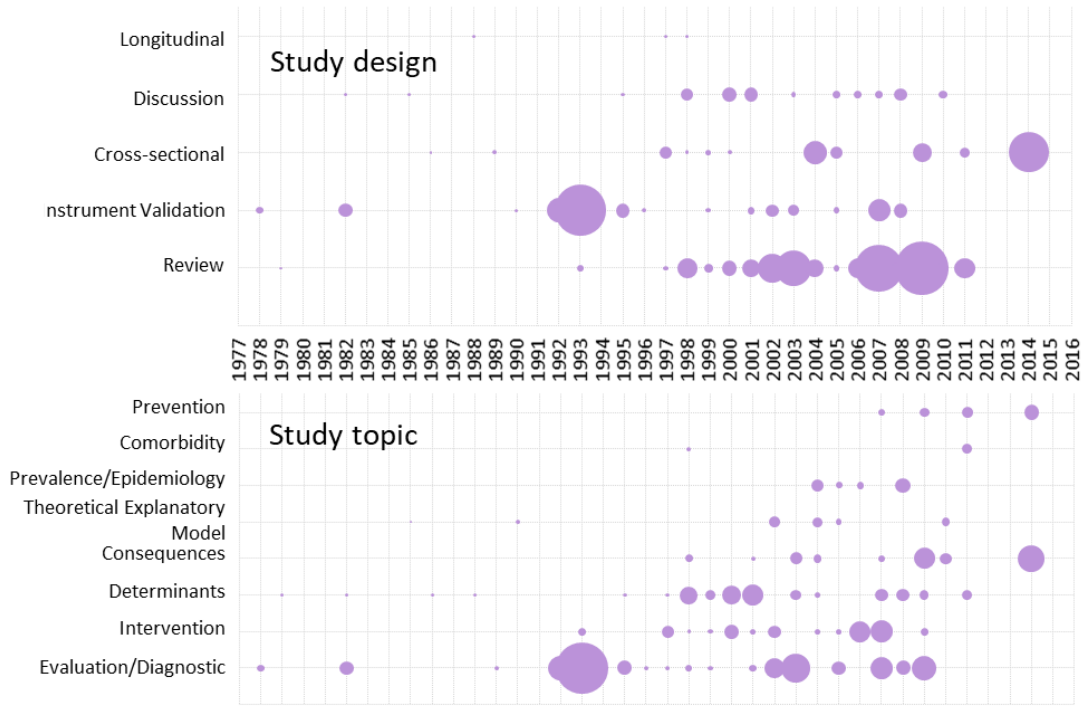


Note: Representation of words with a minimum frequency of two (excluding the words 'article' and 'study'). A Thesauro file was used to replace words with different spellings. The size of the circle indicates the frequency of occurrence of the keyword, and the colour bar indicates the mean number of citations.

Source: Own elaboration.

Fig. 4 – The network of words from the titles of the100 most cited articles in substance abuse.

In terms of study design (fig. 5), 43 were review articles. They received the highest number of citations (36%). In second place were the 23 studies on instrument validation (34.56% of citations). Less frequent were cross-sectional (n = 16; 13.75% citations); discussions of topics or methods (n = 15; 12.97% citations); and longitudinal (n = 3; 1.97% citations). There were no studies with a qualitative methodology.



Legend: X-axis: publication year; Y-axis: study design/topic; bubble size: mean number of citations.

Source: Own elaboration.

Fig. 5 – Mean number of citations per year according to study design and study topic.

Regarding the study topic (fig. 5), 32 focused on aspects of evaluation/diagnosis, mainly related with substances. They received the majority of citations (42.63%) and had the highest mean number of citations per study (M = 1005.52). In the second topic, determinants of substance use and disorders (alcohol, nicotine, drugs in general) (n = 24; 20.07% citations), personal factors stand out (n = 18), along with environmental factors, and family and group factors. Third, studies focusing on intervention (n = 17; 15.32% citations) should be highlighted, especially those that evaluate the effectiveness (n = 14) of various practices, such as brief interventions or contingency management. Fourth (n = 11; 8.52% citations) were studies on the organic consequences of alcohol, tobacco and energy drink consumption. Fourth, different aspects of explanatory theoretical models are analyzed or discussed (n = 6; 5.28% citations). Fifth, five studies (4.12% citations) addressed the prevalence of alcohol, tobacco, stimulant and drug consumption in general in certain countries or specific groups of consumers. Finally, there were

four studies on alcohol and tobacco prevention (n = 4; 2.73% citations) and two related to psychiatric comorbidity (n = 2; 1.32% citations).

Discussion

The objective of this study was to comprehensively analyze the T100 in the WOS database in the substance abuse category (JCR 2019). Although the number of citations that an article receives does not fully express its historical importance or its scientific quality, it does reflect the impact, recognition and influence the article has had on the scientific and professional community and offers a means of understanding the social structure and organization of a knowledge area.[11] In addition, citations provide an objective measure of the performance, value and impact of a study and its researchers.[12] All of the T100 in SA can be considered citation classics or highly cited papers since each has had more than 400 citations.[13] This confirms that SA is an area of high productivity with studies that have a marked influence.

Regarding citation trends, given that the T100 were published over a period of 40 years, it would be expected that the oldest studies were the most cited. However, most of them were published after the year 2000 (n = 64), and they received the most citations (54.22%). In addition, the statistical results show that the most recent articles had a greater number of citations and a higher citation density, a finding that is consistent with other studies (14-16). This trend in citation may be because the most recent studies are more electronically accessible than the oldest ones (only published in a physical format).[17] In addition, the absence of studies prior to 1978 points to the phenomenon of 'obliteration by incorporation',[18] according to which, over time, the oldest studies are cited increasingly less often since their content has been incorporated into more current articles.

Regarding study design, review papers were the most frequent, the most recent, and the most cited; in addition, they included all study topics. This highlights the importance that the SA area gives to knowledge based on rigorous methodology and to practice based on the scientific evidence necessary to provide quality in health systems.[19] Due to their greater frequency, reviews on the personal

determinants of alcohol consumption, the effects of treatments and interventions, evaluation and diagnosis and the organic consequences of the consumption of alcohol and nicotine stand out.

In the case of studies of diagnostic evaluation, reviews are the second most frequently study design, surpassed by test validation studies. This is expected since it is necessary to reference the instruments used[20] to evaluate, diagnose or classify the severity of symptoms.[21] However, in studies of the effectiveness of interventions and the determinants of consumption, reviews are most frequent, followed by cross-sectional studies and discussions or expert approaches. This topic also includes the only three longitudinal studies. This is surprising given the relevance of this methodology to evaluating the evolution of a condition or characteristic, attitude or knowledge.[22] It is necessary to investigate whether this type of study is actually cited less frequently or if it is published in indexed journals in other areas.

It is also surprising to find only three studies on a potential behavioral addiction: a review of an explanatory model of problematic gambling from 2002, a review of comorbidity and gambling from 2011 and a discussion of behavioral addiction from 2010. Despite discussion among experts for years on the limits of what is considered addictive behaviour,[23,24] gambling behavior is the only one included in the T100. It seems that the most cited literature in the area of SA does not reflect this concern among experts.

Regarding international representation in this ranking, although authors from 170 institutions in 24 countries on five continents participated, the USA clearly leads this ranking, with the largest number of primary authors (74%), the largest number of institutions involved (67.38%) and the largest international collaboration network (with 17 countries). This has also been found in other studies[6,25] and could be because this country has some of the main research centers in SA and invests more funds in research than others. In addition, its researchers tend to cite more research from their own country.[26,27] The absence of primary authors from Asia, Africa and South America, as well as the low incidence from Oceania, shows that the participation of these regions does not define the list of the most cited studies. West and McIlwaine,[28] in their study on the value of citation count as a quality

index in the field of addictions, concluded that the number of citations reflects the geographical area of a study more than its quality, highlighting the disadvantage experienced by developing countries. In addition, linguistic barriers, difficulties in establishing professional networks or limited access to information or funding could explain this fact and could serve as objectives for policies of scientific improvement in this area of research.

The T100 in SA were published in less than half (18 of 40) of the journals in the 2019 JCR SA category, and 70% were published in only four. Almost three-quarters of the articles were published in the top journals of this specialty (Q1 and Q2), which attract higher-quality studies, which in turn receive a greater number of citations and contribute to increasing the impact factor and academic influence of these journals.[29] Regarding the impact factor Jones concluded[30] that the area of SA had a lower median impact factor than other areas in basic and related clinical research. However, 20 years later, according to the 2019 JCR, SA had an impact factor (2.320 SSCI; 2.789 SCIE) similar or superior to that of other research areas related to alcohol and substance abuse, such as psychiatry (1.941 SSCI; 2.500 SCIE), psychology (2.172), clinical psychology (2.013), and public, environmental & occupational health (1.673 SSCI; 2.104 SCIE). This fact is indicative of the increasing visibility of this specialty among its own specialists, showing that a culture of research consumption is growing within this group and is configured as a forum for debate and development.[16]

Limitations

We acknowledge certain limitations of this study. Only the WOS database was used, and the T100 list and the number of citations were conditioned by this fact. The results would have been different if the search had been performed in the 128 active journals listed by Ulrich or if the citation data of Scopus or Google Scholar had been considered. However, the JCR is the only index that includes a specific category for SA, and the WOS, although it does not represent all peer-reviewed publications, provides extensive and multidisciplinary information, with more than 34586 journals, books and proceedings from 1800 to the present. It is also possible that some important articles with considerable influence on SA did not appear in this ranking because they were published in journals in other 2019 JCR categories.

Furthermore, self-citations were not taken into account, nor did we consider whether citations were positive or negative; therefore, the level of agreement or criticism of the scientific community regarding the ranked articles could not be determined.[31]

Conclusions

The 100 most cited studies in the area of SA (JCR 2019) are citation classics (+400 citations). They were published over 40 years and the most recent ones received the highest number of citations and had a higher citation density. The majority were reviews and validation studies of evaluation instruments; there was a very low incidence of randomized controlled trials and longitudinal studies. The most discussed topics were the creation and validation of instruments for the evaluation and diagnosis of substance abuse, as well as determinants of abuse and dependence, also only of substances; representation of behavioral addictions was very low. Although authors from all continents were represented, most were from the USA, which also had the largest network of international collaboration. Finally, the T100 were published primarily in only four of the 40 journals in the SA category, and together, they have a median impact factor similar or superior to that of other JCR categories pertaining to basic and related clinical research.

References

1. United Nations Office on Drugs and Crime. World Drug Report 2020. UNODC. 2020 [access 31/06/2023]. Available from: https://wdr.unodc.org/wdr2020/index.html

2. Zou Y, Luo Y, Zhang J, Xia N, Tan G, Huang C. Bibliometric analysis of oncolytic virus research, 2000 to 2018. Med. 2019;98(35):e16817. DOI: https://doi.org/10.1097/MD.0000000000016817

3. Wu Y, Zhao Y, Lin L, Lu Z, Guo Z, Li X, *et al*. Fifty top-cited spine articles from mainland China: A citation analysis. J Int Med Res. 2018;46(2):773-84. DOI: https://doi.org/10.1177/0300060517713804

4. Wong ELY, Tam WWS, Wong FCY, Cheung AWL. Citation classics in nursing journals: The top 50 most frequently cited articles from 1956 to 2011. Nurs Res. 2013;62(5):344-51. DOI: https://doi.org/10.1097/NNR.0b013e3182a2adff

5. Huo Y, Pan X, Li Q, Wang X, Jiao X, Jia Z, *et al*. Fifty top-cited classic papers in orthopedic elbow surgery: A bibliometric analysis. Int J Surg. 2015;18:28-33. DOI: https://doi.org/10.1016/j.ijsu.2015.03.020

6. Pagni M, Khan NR, Cohen HL, Choudhri AF. Highly cited works in radiology: The top 100 cited articles in radiologic journals. Acad Radiol. 2014;21(8):1056-66. DOI: https://doi.org/10.1016/j.acra.2014.03.011

7. Bradford S. Sources of information on specific subjects. Engineering: An Illustrated Weekly Journal. 1934;137:85-6.

8. Brookes BC. Bradfords law and bibliography of science. Nature. 1969;224(5223):953-6. DOI: https://doi.org/10.1038/224953a0

9. IBM CR 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk: NY; 2019.

10. van Eck NJ, Waltman L. Software survey: VOSviewer, a computer program for bibliometric mapping. Scientometrics. 2010;84(2):523-38. DOI: https://doi.org/10.1007/s11192-009-0146-3

11. Annalingam A, Damayanthi H, Jayawardena R, Ranasinghe P. Determinants of the citation rate of medical research publications from a developing country. SpingerPlus. 2014;3(140). DOI: https://doi.org/10.1186/2193-1801-3-140

12. Garfield E. Citation analysis as a tool for science policy studies. Sci Mag. 1972;3:471-9. DOI: https://doi.org/10.1126/science.178.4060.471

13. Garfield E. What is a Citation Classic? 2009 [access 20/06/2023]. Available from: http://www.garfield.library.upenn.edu/classics.html

14. Jiang Y, Hu R, Zhu G. Top 100 cited articles on infection in orthopaedics A bibliometric analysis. Med. 2019;98(2):e14067. DOI: https://doi.org/10.1097/MD.0000000000014067

15. Uthman OA, Okwundu CI, Wiysonge CS, Young T, Clarke A. Citation classics in systematic reviews and meta-analyses: Who wrote the top 100 most cited articles? PLoS One. 2013;8(10):e78517. DOI: https://doi.org/10.1371/journal.pone.0078517

16. Martín-Del-Río B, Solanes-Puchol A, Martínez-Zaragoza F, Benavides-Gil G. Stress in nurses: The 100 top-cited papers published in nursing journals. J Adv Nurs. 2018;74(7):1488-504. DOI: https://doi.org/10.1111/jan.13566

17. Joyce KM, Joyce CW, Kelly JC, Kelly JL, Carroll SM. Levels of evidence in the plastic surgery literature: A citation analysis of the top 50 "classic" papers. Arch Plast Surg. 2015;42(4):411-8. DOI: https://doi.org/10.5999/aps.2015.42.4.411

18. Merton RK. The Matthew effect in science, II: Cumulative advantage and the symbolism of intellectual property. ISIS. 1988;79(299):606-23. DOI: https://doi.org/10.1086/354848

19. Glasner-Edwards S, Rawson R. Evidence-based practices in addiction treatment: Review and recommendations for public policy. Health Policy Educ. 2010;97(2-3):93-104. DOI: https://doi.org/10.1016/j.healthpol.2010.05.013

20. Van Noorden R, Maher B, Nuzzo R. The Top 100 papers. Nature. 2014;514(7524):550-3. DOI: https://doi.org/10.1038/514550a

21. Lipsman N, Lozano AM. The most cited works in major depression: The "Citation classics." J Affect Disord. 2011;134(1-3):39-44. DOI: https://doi.org/10.1016/j.jad.2011.05.031

22. Kesmodel US. Cross-sectional studies-what are they good for? Acta Obstet Gynecol Scand. 2018;97(4):388-93. DOI: https://doi.org/10.1111/aogs.13331

23. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. In: 5th ed. Washington, USA: American Psychiatric Publishing; 2013.

24. Pedrero Pérez EJ, Rodríguez Monje MT, de Leon JM. Mobile phone abuse or addiction. A review of the literature. Adicciones. 2012 [access 12/04/2023];24(2):139-52. Available from: https://www.redalyc.org/articulo.oa?id=289122912007

25. EShuaib W, Khan MS, Shahid H, Valdes EA, Alweis R. Bibliometric analysis of the top 100 cited cardiovascular articles. Am J Cardiol. 2015;115(7):972-81. DOI: https://doi.org/10.1016/j.amjcard.2015.01.029

26. Campbell FM. National bias: a comparison of citation practices by health professionals. Bull Med Libr Assoc. 1990 [access 12/04/2023];78(4):376-82. Available from:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC225441/pdf/mlab00125-0058.pdf

27. Link AM. US and Non-US submissions. An analysis of reviewer bias. JAMA J Am Med Assoc. 1998;280(3):246-7. DOI: https://doi.org/10.1001/jama.280.3.246

28. WestE R, McIlwaine A. What do citation counts count for in the field of addiction? An empirical evaluation of citation counts and their link with peer ratings of quality. Addiction. 2002;97(5):501-4. DOI: https://doi.org/10.1046/j.1360-0443.2002.00104.x

29. Callaham M, Wears RL, Weber E. Journal prestige, publication bias, and other characteristics associated with citation of published studies in peer-reviewed journals. JAMA J Am Med Assoc. 2002;287(21):2847-50. DOI: https://doi.org/10.1001/jama.287.21.2847

30. Jones AW. The impact of alcohol and alcoholism among substance abuse journals. Alcohol. 1999;34(1):25-34. DOI: https://doi.org/10.1093/alcalc/34.1.25

31. Cavalcanti DC, Prudêncio RB, Pradhan SS, Shah JY, Pietrobon RS. Good to be bad? Distinguishing between positive and negative citations in scientific impact. In: Proceedings of the 2011 IEEE 23rd International Conference on Tools with Artificial Intelligence. IEEE Computer Society; 2011:156-62. DOI: https://doi.org/10.1109/ICTAI.2011.32

Annex I

A1. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption-II. Addiction. 1993;88(6):791-804. DOI: https://doi.org/10.1111/j.1360-0443.1993.tb02093.x

A2. Linehan MM, Schmidt H, Dimeff LA, Craft JC, Kanter J, Comtois KA. Dialectical Behavior Therapy for patients with borderline personality disorder and drug-dependence. Am J Addict. 1999;8(4):279-92. DOI: https://doi.org/10.1080/105504999305686

A3. McLellan AT, Kushner H, Metzger D, Peters R, Smith I, Grissom G, *et al*. The fifth edition of the Addiction Severity Index. J Subst Abuse Treat. 1992;9(3):199-213. DOI: https://doi.org/10.1016/0740-5472(92)90062-s

A4. Babor TF, McRee BG, Kassebaum PA, Grimaldi PL, Ahmed K, Bray J. Screening, Brief Intervention, and Referral to Treatment (SBIRT): Toward a public health approach to the management of substance abuse. Subst Abus. 2007;28(3):7-30. DOI: https://doi.org/10.1300/J465v28n03_03

A5. Skinner HA. The drug abuse screening test. Addict Behav. 1982;7:363-71. DOI: https://doi.org/10.1016/0306-4603(82)90005-3

A6. Samson HH. Initiation of ethanol reinforcement using a sucrose-substitution procedure in food-sated and water-sated rats. Alcohol Clinical Exp Res. 1986;10(4):436-42. DOI: https://doi.org/10.1111/j.1530-0277.1986.tb05120.x

A7. Fagerström KO. Measuring degree of physical dependence to tobacco smoking with reference to individualization of treatment. Addict Behav. 1978;3(3-4):235-41. DOI: https://doi.org/10.1016/0306-4603(78)90024-2

A8. Cloninger CR, Sigvardsson S, Bohman M. Childhood personality predicts alcohol-abuse in young-adults. Alcohol Clin Exp Res. 1988 Aug;12(4):494-505. DOI: https://doi.org/10.1111/j.1530-0277.1988.tb00232.x

A9. Muthen B, Muthen LK. Integrating person-centered and variable-centered analyses: Growthmixture modeling with latent trajectory classes. Alcohol Exp Res. 2000 Jun;24(6):882-91. DOI: https://doi.org/10.1111/j.1530-0277.2000.tb02070.x

A10. Rollnick S, Heather N, Gold R, Hall W. Development of a short readiness to change questionnaire for use in brief, opportunistic interventions among excessive drinkers. Br J Addict. 1992 May;87(5):743–54. DOI: https://doi.org/10.1111/j.1360-0443.1992.tb02720.x

A11. Proyect Match Research Group. Matching alcoholism treatments to client heterogeneity: Project MATCH posttreatment drinking outcomes. J Stud Alcohol. 1997 Jan;58(1):7-29. DOI: https://doi.org/10.15288/jsa.1997.58.7

A12. McCabe SE, Knight JR, Teter CJ, Wechsler H, Wechser H. Non-medical use of prescription stimulants among US college students: prevalence and correlates from a national survey. Addiction. 2005 Jan;100(1):96-106. DOI: https://doi.org/10.1111/j.1360-0443.2005.00944.x

A13. Gormally J, Black S, Daston S, Rardin D. The assessment of binge eating severity among obese persons. Addict Behav. 1982;7(1):47-55. DOI: https://doi.org/10.1016/0306-4603(82)90024-7

A14. Wagenaar AC, Salois MJ, Komro KA. Effects of beverage alcohol price and tax levels on drinking: A meta-analysis of 1003 estimates from 112 studies. Addiction. 2009;104(2):179-90. DOI: https://doi.org/ 10.1111/j.1360-0443.2008.02438.x

A15. Bien T, Miller W, Tonigan J. Brief interventions for alcohol problems: A review. Addiction. 1993 [access 14/01/2023];88(3):315-35. Available from: http://www.scopus.com/inward/record.url?eid=2-s2.0-0027468314&partnerID=40&md5=fc5efc1175acd662c6070cd676453ef5

A16. Wise RA. Drug-activation of brain reward pathways. Drug Alcohol Depend. 1998;51(1-2):13-22. DOI: https://doi.org/10.1016/s0376-8716(98)00063-5

A17. Grant BF, Dawson DA, Stinson FS, Chou SP, Dufour MC, Pickering RP. The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991-1992 and 2001-2002. Drrug Alcohol Depend. 2004 [access 14/01/2023];74(3):223-34. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6527253/pdf/79-91.pdf

A18. Goldstein PJ. The drugs/violence nexus: A tripartite conceptual framework. J Drug Issues. 1985;15(4):493-506. DOI: https://doi.org/10.1177/0022042685015004

A19. Blaszczynski A, Nower L. A pathways model of problem and pathological gambling. Addiction. 2002;97:487-99. DOI: https://doi.org/10.1046/j.1360-0443.2002.00015.x

A20. Greenfield SF, Brooks AJ, Gordon SM, Green CA, Kropp F, McHugh RK, et al. Substance abuse treatment entry, retention, and outcome in women: Areview of the literature. Drug Alcohol Depend. 2007;86(1):1-21. DOI: https://doi.org/10.1016/j.drugalcdep.2006.05.012

A21. Carter BL, Tiffany ST. Meta-analysis of cue-reactivity in addiction research. Addiction. 1999;94(3):327-40. DOI: https://doi.org/10.1046/j.1360-0443.1999.9433273.x

A22. Hammond D. Health warning messages on tobacco products: a review. Tob Control. 2011;20(5):327-37. DOI: https://doi.org/10.1136/tc.2010.037630

A23. Grant BF, Dawson DA, Stinson FS, Chou PS, Kay W, Pickering R. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): Reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. Drug Alcohol Depend. 2003;71(1):7-16. DOI: https://doi.org/10.1016/S0376-8716(03)00070-X

A24. Pomerleau CS, Carton SM, Lutzke ML, Flessland KA, Pomerleau OF. Reliability of the fagerstrom tolerance questionnaire and the fagerstrom test for nicotine dependence. Addict Behav. 1994;19(1):33-9. DOI: https://doi.org/10.1016/0306-4603(94)90049-3

A25. Robinson TE, Berridge KC. The psychology and neurobiology of addiction: an incentive-sensitization view. Addiction. 2000;95(8s2):91-117. DOI: https://doi.org/10.1080/09652140050111681

A26. Di Chiara G. The role of dopamine in drug-abuse viewed from the perspective of its role in motivation. Drug Alcohol Depend. 1995;38(2):95-137. DOI: https://doi.org/10.1016/0376-8716(95)01118-lh

A27. Robinson TE, Berridge KC. Incentive-sensitization and addiction. Addiction. 2001;96(1):103-14. DOI: https://doi.org/10.1016/0376-8716(95)01118-i

A28. Fazel S, Bains P, Doll H. Substance abuse and dependence in prisoners: A systematic review. Addiction. 2006;101(2):181-91. DOI: https://doi.org/10.1111/j.1360-0443.2006.01316.x

A29. Tzschentke TM. Measuring reward with the conditioned place preference (CPP) paradigm:update of the last decade. Addict Biol. 2007;12(3-4):227-462. DOI: https://doi.org/10.1111/j.1369-1600.2007.00070.x

A30. Lussier JP, Heil SH, Mongeon JA, Badger GJ, Higgins ST. A meta-analysis of voucher-based reinforcement therapy for substance use disorders. Addiction. 2006;101(2):192-203. DOI: https://doi.org/10.1111/j.1360-0443.2006.01311.x

A31. Hughes J, Keely J, Niaura R, Ossip-Klein D, Richmond R, Swan G. Measures of abstinence in clinical trials: issues and recommendations. Nicotine Tob Res. Available from: https://pubmed.ncbi.nlm.nih.gov/12745503/

A32. Jones BT, Corbin W, Fromme K. A review of expectancy theory and alcohol consumption. Addiction. 2001;96(1):57-72. DOI: https://doi.org/10.1046/j.1360-0443.2001.961575.x

A33. Hughes JR, Keely J, Naud S. Shape of the relapse curve and long-term abstinence among untreated smokers. Addiction. 2004;99(1):29-38. DOI: https://doi.org/10.1111/j.1360-0443.2004.00540.x

A34. Koob GF. Alcoholism: Allostasis and beyond. Alcohol Exp Res. 2003;27(2):232-43. DOI: https://doi.org/10.1097/01.ALC.0000057122.36127.C2

A35. Goniewicz ML, Knysak J, Gawron M, Kosmider L, Sobczak A, Kurek J, et al. Levels of selected carcinogens and toxicants in vapour from electronic cigarettes. Tob Control. 2014;23(2):133-9. DOI: https://doi.org/10.1136/tobaccocontrol-2012-050859

A36. Merikangas KR, Mehta RL, Molnar BE, Walters EE, Swendsen JD, Aguilar-Gaziola S, et al. Comorbidity of substance use disorders with mood and anxiety disorders. Addict Behav. 1998;23(6):893-907. DOI: https://doi.org/10.1016/s0306-4603(98)00076-8

A37. Darke S. Self-report among injecting drug users: a review. Drug Alcohol Depend. 1998;51(3):253-63. DOI: https://doi.org/10.1016/s0376-8716(98)00028-3

A38. Arnett EJ. The developmental context of substance use in emerging adulthood. J Drug Issues. 2005;35(2):235-53. DOI: https://doi.org/10.1177/002204260503500202

A39. De Wit H. Impulsivity as a determinant and consequence of drug use: A review of underlying processes. Addict Biol. 2009;14(1):22-31. DOI: https://doi.org/10.1111/j.1369-1600.2008.00129.x

A40. Dennis M, Godley SH, Diamond G, Tims FM, Babor T, Donaldson J, *et al*. The Cannabis Youth Treatment (CYT) Study: Main findings from two randomized trials. J Subst Abuse Treat. 2004;27(3):197-213. DOI: https://doi.org/10.1016/j.jsat.2003.09.005

A41. Reinert DF, Allen JP. The Alcohol Use Disorders Identification Test: An update of research findings. Alcohol Exp Res. 2007;31(2):185-99. DOI: https://doi.org/10.1111/j.1530-0277.2006.00295.x

A42. Miller WR, Wilbourne PL. Mesa Grande: a methodological analysis of clinical trials of treatments for alcohol use disorders. Addiction. 2002;97(3):265-77. DOI: https://doi.org/10.1046/j.1360-0443.2002.00019.x

A43. Field M, Cox WM. Attentional bias in addictive behaviors: A review of its development,causes, and consequences. Drug Alcohol Depend. 2008;97(1-2):1-20. DOI: https://doi.org/10.1016/j.drugalcdep.2008.03.030

A44. CareyE KB, Scott-Sheldon LAJ, Carey MP, DeMartini KS. Individual-level interventions to reduce college student drinking: A meta-analytic review. Addict Behav. 2007;32(11):2469–94. DOI: https://doi.org/10.1016/j.addbeh.2007.05.004

A45. Gossop M, Darke S, Griffiths P, Hando J, Powis B, Hall W, et al. The Severity of Dependence Scale (SDS): Psychometric properties of the SDS in English and Australian samples of heroin, cocaine and amphetamine users. Addiction. 1995;90(5):607-14. DOI: https://doi.org/10.1046/j.1360-0443.1995.9056072.x

A46. Moyers TB, Martin T, Manuel JK, Hendrickson SML, Miller WR. Assessing competence in the use of motivational interviewing. J Subst Abuse Treat. 2005;28(1):19-26. DOI: https://doi.org/10.1016/j.jsat.2004.11.001

A47. Heatherton TF, Kozlowski LT, Frecker RC, Rickert W, Robinson J. Measuring the Heaviness of Smoking: using self-reported time to the first cigarette of the day and number of cigarettes smoked per day. Br J Addict. 1989;84(7):791-800. DOI: https://doi.org/10.1111/j.1360-0443.1989.tb03059.x

A48. Lorains FK, Cowlishaw S, Thomas SA. Prevalence of comorbid disorders in problem and pathological gambling: Systematic review and meta-analysis of population surveys. Addiction. 2011;106(3):490-8. DOI: https://doi.org/10.1111/j.1360-0443.2010.03300.x

A49. Cox LS, Tiffany ST, Christer AG. Evaluation of the brief questionnaire of smoking urges (QSU-brief) in laboratory and clinical settings. Nicotine Tob Res. 2001;3:7-16. DOI: https://doi.org/10.1080/14622200020032051

A50. Anton RF, Moak DH, Latham P. The Obsessive-Compulsive Drinking Scale: a self-rated instrument for the quantification of thoughts about alcohol and drinking behavior. Alcohol Clinical Exp Res. 1995;19(1):92-9. DOI: https://doi.org/10.1111/j.1530-0277.1995.tb01475.x

A51. Bradley KA, DeBenedetti AF, Volk RJ, Williams EC, Frank D, Kivlahan DR. AUDIT-C as a brief screen for alcohol misuse in primary care. Alcohol Exp Res. 2007;31(7):1208-17. DOI: https://doi.org/10.1111/j.1530-0277.2007.00403.x

A52. Ziedonis DM, Hitsman B, Beckham JC, Zvolensky M, Adler LE, Audrain-McGovern J, et al. Tobacco use and cessation in psychiatric disorders: National Institute of Mental Health report. Nicotine Tob Res. 2008;10(12):1691-715. DOI: https://doi.org/10.1080/14622200802443569

A53. Ali R, Awwad E, Babor TF, Bradley F, Butau T, Farrell M, *et al*. The Alcohol, Smoking and Substance Involvement Screening Test (Assist): Development, reliability and feasibility. Addiction. 2002;97(9):118394. DOI: http://dx.doi.org/10.1046/j.1360-0443.2002.00185.x

A54. Martin CS, Earleywine M, Musty RE, Perrine MW, Swift RM. Development and validation of the Biphasic Alcohol Effects Scale. Alcohol Clin Exp Res. 1993;17(1):140-6. DOI: https://doi.org/10.1111/j.1530-0277.1993.tb00739.x

A55. Moyer A, Finney JW, Swearingen CE, Vergun P. Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-seeking populations. Addiction. 2002;97:279-92. DOI: https://doi.org/10.1046/j.1360-0443.2002.00018.x

A56. Kreek MJ, Koob GF. Drug dependence: stress and dysregulation of brain reward pathways. Drug Alcohol Depend. 1998;51(1-2):23-47. DOI: https://doi.org/10.1016/s0376-8716(98)00064-7

A57. Del Boca FK, Darkes J. The validity of self-reports of alcohol consumption: State of the science and challenges for research. Addiction. 2003;98(suppl. 2):1-12. DOI: https://doi.org/10.1046/j.1359-6357.2003.00586.x

A58. Lehman WEK, Greener JM, Simpson DD. Assessing organizational readiness for change. J Subst Abuse Treat. 2002;22(4):197-209. DOI: https://doi.org/10.1016/s0740-5472(02)00233-7

A59. Bickel WK, Marsch LA. Toward a behavioral economic understanding of drug dependence: Delay discounting processes. Addiction. 2001;96(1):73-86. DOI: https://doi.org/10.1046/j.1360-0443.2001.961736.x

A60. Marshal MP, Friedman MS, Stall R, King KM, Miles J, Gold MA, *et al*. Sexual orientation and adolescent substance use: A meta-analysis and methodological review. Addiction. 2008;103(4):546-56. DOI: https://doi.org/10.1111/j.1360-0443.2008.02149.x

A61. Cnattingius S. The epidemiology of smoking during pregnancy: Smoking prevalence, maternal characteristics, and pregnancy outcomes. Nicotine Tob Res. 2004;6(SUPPL. 2):s125-40. DOI: https://doi.org/10.1080/14622200410001669187

A62. Prendergast M, Podus D, Finney J, Greenwell L, Roll J. Contingency management for treatment of substance use disorders: A meta-analysis. Addiction. 2006;101(11):1546-60. DOI: https://doi.org/10.1111/j.1360-0443.2006.01581.x

A63. Cotton NS. The familial incidence of alcoholism. A review. J Stud Alcohol. 1978;40(1):89-116. DOI: https://doi.org/10.15288/jsa.1979.40.89

A64. Larimer ME, Cronce JM. Identification, prevention, and treatment revisited: Individual-focused college drinking prevention strategies 1999-2006. Addict Behav. 2007;32(11):2439-68. DOI: https://doi.org/10.1016/j.addbeh.2007.05.006

A65. Lieber CS, DeCarli LM. The feeding of alcohol in liquid diets: Two decades of applications and 1982 update. Alcohol Clin Exp Res. 1982;6(4):523-31. DOI: https://doi.org/10.1111/j.1530-0277.1982.tb05017.x

A66. Hughes JR. Effects of abstinence from tobacco: Valid symptoms and time course. Nicotine Tob Res. 2007;9(3):315-27. DOI: https://doi.org/10.1080/14622200701188919

A67. Hingson RW, Zha W, Weitzman ER. Magnitude of and trends in alcohol-related mortality and morbidity among U.S. college students ages 18-24, 1998-2005. J Stud Alcohol Drugs. 2009;(s16):12-20. DOI: https://doi.org/10.15288/jsads.2009.s16.12

A68. Etter JF, Bullen C. Electronic cigarette: Users profile, utilization, satisfaction and perceived efficacy. Addiction. 2011;106(11):2017-28. DOI: https://doi.org/10.1111/j.1360-0443.2011.03505.x

A69. West R, Hajek P, Stead L, Stapleton J. Outcome criteria in smoking cessation trials: Proposal for a common standard. Addiction. 2005;100(3):299-303. DOI: https://doi.org/10.1111/j.1360-0443.2004.00995.x

A70. Zhu S-H, Sun JY, Bonnevie E, Cummins SE, Gamst A, Yin L, et al. Four hundred and sixty brands of e-cigarettes and counting: implications for product regulation. Tob Control. 2014;23(3):3-9. DOI: https://doi.org/10.1136/tobaccocontrol-2014-051670

A71. Rehm J, Room R, Graham K, Monteiro M, Gmel G, Sempos CT. The relationship of average volume of alcohol consumption and patterns of drinking to burden of

disease: An overview. Addiction. 2003;98(9):1209-28. DOI: https://doi.org/10.1046/j.1360-0443.2003.00467.x

A72. Wilsnack RW, Vogeltanz ND, Wilsnack SC, Harris TR, Ahlström S, Bondy S, et al. Gender differences in alcohol consumption and adverse drinking consequences: Cross-cultural patterns. Addiction. 2000;95(2):251-65. DOI: https://doi.org/10.1046/j.1360-0443.2000.95225112.x

A73. Reinert DF, Allen JP. The Alcohol Use Disorders Identification Test (AUDIT): A review ofrecent research. Alcohol Exp Res. 2002;26(2):272-9. DOI: https://doi.org/10.1111/j.1530-0277.2002.tb02534.x

A74. Humeniuk R, Ali R, Babor TF, Farrell M, Formigoni ML, Jittiwutikarn J, *et al*. Validation of the alcohol, smoking and substance involvement screening test (ASSIST). Addiction. 2008;103(6):1039-47. DOI: https://doi.org/10.1111/j.1360-0443.2007.02114.x

A75. Tyas SL, Pederson LL. Psychosocial factors related to adolescent smoking: a critical review of the literature. Tob Control. 1998;7(4):409-20. DOI: https://doi.org/10.1136/tc.7.4.409

A76. Hawkins JD, Graham JW, Maguin E, Abbott R, Hill KG, Catalano RF. Exploring the effects of age of alcohol use initiation and psychosocialrisk factors on subsequent alcohol misuse. J Stud Alcohol. 1997;58(3):280–90. DOI: https://doi.org/10.15288/jsa.1997.58.280

A77. Corrao G, Rubbiati L, Bagnardi V, Zambon A, Poikolainen K. Alcohol and coronary heart disease: A meta-analysis. Addiction. 2000;95(10):1505-23. DOI: https://doi.org/10.1046/j.1360-0443.2000.951015056.x

A78. Allen J, Anton RF, Babor TF, Carbonari J, Carroll KM, Connors GJ, et al. Matching alcoholism treatments to client heterogeneity: Project MATCH three-year drinking outcomes. Alcohol Clin Exp Res. 1998;22(6):1300-11. DOI: https://doi.org/10.15288/jsa.1997.58.7

A79. Grant BF, Harford TC, Dawson DA, Chou PS, Pickering RP. The Alcohol Use Disordeer and Associated Disabilities Interview Schedule (AUDADIS): Reliability of Alcohol and Drug Modules in a General Population Sample. Drug Alcohol Depend. 1995;39(1):37-44. DOI: https://doi.org/10.1016/0376-8716(95)01134-k

A80. Mattson SN, Riley EP. A review of the neurobehavioral deficits in children with fetal alcohol syndrome or prenatal exposure to alcohol. Alcohol Clin Exp Res. 1998;22(2):279-94. DOI: https://doi.org/10.1111/j.1530-0277.1998.tb03651.x

A81. Gorber SC, Schofield-Hurwitz S, Hardt J, Levasseur G, Tremblay M. The accuracy of self-reported smoking: A systematic review of the relationship between self-reported and cotinine-assessed smoking status. Nicotine Tob Res. 2009;11(1):12-24. DOI: https://doi.org/10.1093/ntr/ntn010

A82. Ruan WJ, Goldstein RB, Chou SP, Smith SM, Saha TD, Pickering RP, et al. The Alcohol Use Disorder and Associated Disabilities InterviewSchedule-IV (AUDADIS-IV): Reliability of new psychiatric diagnostic modules and risk factors in a general population sample. Drug Alcohol Depend. 2008;92(1-3):27-36. DOI: https://doi.org/10.1016/j.drugalcdep.2014.11.026

A83. Rehm J, Baliunas D, Borges GLG, Graham K, Irving H, Kehoe T, et al. The relation between different dimensions of alcohol consumption and burden of disease: An overview. Addiction. 2010;105(5):817-43. DOI: https://doi.org/10.1111/j.1360-0443.2010.02899.x

A84. Eckardt MJ, File SE, Gessa GL, Grant KA, Guerri C, Hoffman PL, *et al*. Effects of moderate alcohol consumption on the central nervous system. Alcohol Exp Res. 1998;22(5):998-1040. DOI: https://doi.org/10.1111/j.1530-0277.1998.tb03695.x

A85. Allen JP, Litten RZ, Fertig JB, Babor T. A review of research on the Alcohol Use Disorders Identification Test (AUDIT). Alcohol Exp Res. 1997 Jun;21(4):613-9.

A86. Kobus K. Peers and adolescent smoking. Addiction. 2003;98(Suppl 1):37-55. DOI: https://doi.org/10.1111/j.1530-0277.1997.tb03811.x

A87. Velicer WF, Diclemente CC, Rossi JS, Prochaska JO. Relapse situations and self-efficacy. An integrative model. Addict Behav. 1990;15(3):271-83. DOI: https://doi.org/10.1016/0306-4603(90)90070-e

A88. Wu DF, Cederbaum AI. Alcohol, oxidative stress, and free radical damage. Alcohol Research Heal. 2003;27(4):277-84. DOI: https://doi.org/10.1079/PNS2006496

A89. Miller WR, Tonigan JS. Assessing drinkers' motivation for change: The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES). Psychol Addict Behav. 1996;10(2):81-9. DOI: https://doi.org/10.1037/0893-164X.10.2.81

A90. Grant JE, Potenza MN, Weinstein A, Gorelick DA. Introduction to behavioral addictions. Am J Drug Alcohol Abuse. 2010;36(5):233-41. DOI: https://doi.org/10.3109/00952990.2010.491884

A91. Hesselbrock M, Easton C, Bucholz KK, Schuckit M, Hesselbrock V. A validity study of the SSAGA - A comparison with the SCAN. Addiction. 1999;94(9):1361-70. DOI: https://doi.org/10.1046/j.1360-0443.1999.94913618.x

A92. Kirby KN, Petry NM. Heroin and cocaine abusers have higher discount rates for delayed rewards than alcoholics or non-drug-using controls. Addiction. 2004;99(4):461-71. DOI: https://doi.org/10.1111/j.1360-0443.2003.00669.x

A93. Compton WM, Volkow ND. Major increases in opioid analgesic abuse in the United States: Concerns and strategies. Drug Alcohol Depend. 2006 Feb;81(2):103-7. DOI: https://doi.org/10.1016/j.drugalcdep.2005.05.009

A94. Koob GF, Roberts AJ, Schulteis G, Parsons LH, Heyser CJand Hyytia P, Merlo-Pich E, et al. Neurocircuitry targets in ethanol reward and dependence. Alcohol Exp Res. 1998;22(1):3-9. DOI: https://doi.org/10.1097/00000374-199802000-00001

A95. Dunn C, Deroo L, Rivara FP. The use of brief interventions adapted from motivational interviewing across behavioral domains: A systematic review. Addiction. 2001;96(12):1725-42. DOI: https://doi.org/10.1046/j.1360-0443.2001.961217253.x

A96. Rodgers A, Corbett T, Bramley D, Riddell T, Wills M, Lin RB, et al. Do u smoke after txt? Results of a randomised trial of smoking cessationusing mobile phone text messaging. Tob Control. 2005;14(4):255-61. DOI: https://doi.org/10.1136/tc.2005.011577

A97. Reissig CJ, Strain EC, Griffiths RR. Caffeinated energy drinks—A growing problem. Drug Alcohol Depend. 2009 Jan;99(1-3):1-10.

A98. May PA, Gossage JP. Estimating the prevalence of fetal alcohol syndrome. A summary. Alcohol Reseach Heal. 2001;25(3):159-67.

A99. Anderson P, de Bruijn A, Angus K, Gordon R, Hastings G. Impact of alcohol advertising and media exposure on adolescent alcohol use: A systematic review of longitudinal studies. Alcohol. 2009;44(3):229-43. DOI: https://doi.org/10.1093/alcalc/agn115

A100. Madras BK, Compton WA, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) forillicit drug and alcohol use at multiple healthcare sites: Comparison atintake and 6 months later. Drug Alcohol Depend. 2009;99(1–3):280-95. DOI: https://doi.org/10.1016/j.drugalcdep.2008.08.003

Conflict of interests

The authors declare that they have no conflict of interest.

Authors' contribution

Conceptualization: Beatriz Martín-del-Río, María-Teresa Cortés-Tomás.

Data Curation: Beatriz Martín-del-Río, Adrián García-Selva, María-Teresa Cortés-Tomás, José-Antonio Giménez-Costa, Consolación Gómez-Íñiguez.

Formal analysis: Beatriz Martín-del-Río, Adrián García-Selva, María-Teresa Cortés-Tomás, José-Antonio Giménez-Costa, Consolación Gómez-Íñiguez.

Methodology: Beatriz Martín-del-Río, María-Teresa Cortés-Tomás, José-Antonio Giménez-Costa, Consolación Gómez-Íñiguez.

Project administration: Beatriz Martín-del-Río, Adrián García-Selva, María-Teresa Cortés-Tomás.

Software: Beatriz Martín-del-Río, María-Teresa Cortés-Tomás, José-Antonio Giménez-Costa, Consolación Gómez-Íñiguez.

Visualization: Beatriz Martín-del-Río, José-Antonio Giménez-Costa, Consolación Gómez-Íñiguez.

Writing - Original Draft: Beatriz Martín-del-Río, Adrián García-Selva, María-Teresa Cortés-Tomás, José-Antonio Giménez-Costa, Consolación Gómez-Íñiguez.

Writing - Review & Editing: Beatriz Martín-del-Río, Adrián García-Selva, María-Teresa Cortés-Tomás, José-Antonio Giménez-Costa, Consolación Gómez-Íñiguez.